in like manner formed at the expense of the two prophylls. A similar explanation, it may be remarked, has been advanced, also on good grounds, to explain the otherwise anomalous character of the flower and inflorescence in *Adoxa moschatellina*.

The chief part of the work is devoted to the taxonomy of the group and to the description and delineation of the different species. Distribution and hybridisation are briefly considered, and a short chapter on the culture of the waterlilies is added; the work closes with an excellent bibliography.

The illustrations are numerous, and many of them are finely executed in colour, whilst the paper and printing leave nothing to be desired even by the most fastidious bibliophile. The book certainly deserves a place on the shelves of those who are interested in a group more beautiful than most, and perhaps inferior to none, of the plants that are cultivated for the beauty alike of their form and of their colour.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The general board has nominated the following as electors to professorships:—Prof. W. A. Tilden to the professorship of chemistry, Sir W. D. Niven to the Plumian professorship of astronomy, Sir A. Geikie to the professorship of geology, Prof. J. J. Thomson to the Jacksonian professorship of natural philosophy, Sir W. H. Broadbent to the Downing professorship of medicine, Dr. L. Fletcher to the professorship of mineralogy, Prof. Larmor to the professorship of experimental physics, Sir W. H. White to the professorship of mechanism and applied mechanics, Prof. Schäfer to the professorship of physiology, and Dr. J. F. Payne to the professorship of pathology.

Mr. A. R. Brown, of Trinity College, has been elected to the Anthony Wilkin studentship in ethnology and archæology. This is the first election which has been made to this recently founded studentship.

THE Goldsmiths' Company has voted a further sum of 1558*l*., in addition to its previous endowment of the Goldsmiths' College at New Cross, to defray the expenses of putting the buildings in complete working order.

UNDER the auspices of the Society for the Technical Education of Women, founded a few years ago by Mrs. P. N. Arian, a technical high school for women was opened in St. Petersburg on January 28. The new high school has two faculties, one for engineering and building subjects, and the other for electrochemistry, and provides a four-year course in each, which courses it is intended shall be of the same educational standard as those in the same subjects in the present technical high schools.

WE have received a copy of a well illustrated "Souvenir" of the opening last year of the new engineering and metallurgical laboratories of the University of Sheffield. In view of the illustrated article published in NATURE for July 20, 1905, describing the new buildings at Sheffield, it is unnecessary to do more than direct attention to the excellence and great extent of the provision made in this new university for teaching the higher branches of applied science. It is possible from the numerous well executed pictures in the souvenir to form a good idea of the laboratories and their equipment without a visit to Sheffield.

Science announces further munificent gifts to higher education in the United States. Mr. John D. Rockefeller has given 290,000*l*. to the University of Chicago. Of this sum, 200,000*l*. is for the permanent endowment, 70,000*l*. to cover the current expenditures or deficit of the various departments of the University to July 1, 1907, and the remaining 20,000*l*. is to provide a fund, the interest of which is to go to the widow of the late President Harper during her lifetime. By the will of the late Mr. Marshall Field, Chicago receives 1,600,000*l*. for the endowment and maintenance of the Field Columbian Museum. The bequest is on condition that within six years from the death of Mr. Field there shall be provided a satisfactory site for the permanent home of the museum. By the will of the late Mr. W. C. Putnam, the Davenport (Iowa) Academy of Sciences becomes prospectively one of the most richly endowed institutions of its kind in the world. Mr. Putnam left an estate of 140,000*l*. with provisions for limited incomes to relatives, the remainder of the revenues to be paid to the academy, and the entire estate to go to that institution at the death of the surviving brothers and sisters.

UNDER the leadership of Dr. Chiari, a member of the Austrian Government, a petition was recently laid before the Austrian Minister of Education in which the teaching of chemistry in the technical high schools was given the most prominent place. The petition affirmed that the present conditions of the chemical laboratories in the high schools had repeatedly been the subject of severe criticism in technical circles; that neither the space provided, the existing equipment nor the teaching staff was at all adequate to the requirements of modern chemistry. The backwardness of Austrian chemical laboratories could not but most seriously affect the chemical industries; indeed, in no other branch of commerce was a direct and intimate connection with the high schools so absolutely essential. The schools had been neglected, and consequently it was found that instruction in general technical chemistry and the intensive study of those branches of technical chemistry which were particularly suited to Austria had not received that amount of attention which they needed. A scheme involving the erection of a new chemical institute in Vienna was laid before the Government last year. The petitioners desired a speedy settlement of the existing misunderstandings on this subject, as they considered the building of such a chemical institute the first condition to an increased interest in Austrian chemical industries.

A COPY of the address delivered by Sir Alexander R. Binnie at the recent distribution of prizes to students of the Merchant Venturers' Technical College, Bristol, has been received. The address dealt in broad outline with education and with what it in a certain sense implies, the acquisition of knowledge. Answering the question, How do we obtain knowledge? Sir Alexander Binnie said it can only be obtained through those senses with which human beings are endowed. First, knowledge includes sensations directly conveyed, that is, personal knowledge. Then there is knowledge of the world conveyed in books, that is, the teaching of authority; and there is a third, an all important division of knowledge, derived partly through observation, and partly through the mysterious property called mind. Observation and reasoning lead, especially in the line of science, to certainties greater, often more sure and more truthful, than those received through the senses. Later in the address Sir Alexander Binnie urged that in all these matters of education it is necessary to be careful; arrogance and self-conceit are quite out of place. There are limitations to all, but in the study of nature, and the great truths that nature reveals, the human mind is enlarged and its conceptions are elevated. In all the knowledge acquired during the years that human beings are permitted to indulge in that wonderful spectacle which nature presents, a preparation is being undergone, and it is to be hoped an advancement from a lower to a higher grade of mind.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 7, 1905.—"The Determination of the Osmotic Pressures of Solutions by the Measurement of their Vapour Pressures." By the Earl of **Berkeley** and E. G. J. **Hartley**. Communicated by W. C. D. Whetham, F.R.S.

The authors find that Ostwald and Walker's "bubbling" method of determining the lowering of the vapour pressure of solutions is unsatisfactory. They therefore use a form of apparatus such that dry air is allowed to pass over the solution, while the latter is continuously stirred, and then over the solvent. By placing two vessels containing

the solution in series, the constancy of weight of the second vessel indicates that the air has been saturated up to the vapour pressure of the solution. The total quantity of vapour given off by the solution and solvent is absorbed by sulphuric acid, and the gain in weight of the latter should equal the loss sustained by the two former. With solutions in water, it is pointed out that, on account of the condensation of solvent in the tube leading to the sulphuric acid, this never quite obtains. The loss of weight of the solution in conjunction with that of the solvent give, however, the data for calculating the osmotic pressure. It is shown that Arrhenius's formula, when applied to concentrated solutions, does not connect the true osmotic pressure with the lowering of vapour pressure; and a more correct relation is deduced from a consideration of the hydrostatic pressures about a column of solution which is closed at the lower end by a semi-permeable membrane, and is partially immersed in the solvent. It is found that the osmotic pressures of cane-sugar solutions when calculated by way of vapour pressures and when observed directly agree to within 5 per cent. of one another over a range of 20 to 110 atmospheres.

January 25.—"Artificial Double Refraction, due to Æolotropic Distribution, with Application to Colloidal Solutions and Magnetic Fields." By Dr. T. H. **Havelock.** Communicated by Prof. J. Larmor, Sec.R.S.

The sections of the paper are summarised as follows:—

(1) The formal investigation of artificial double refraction in colloidal solutions as due to a deformation of the medium consisting of a change in the packing of the colloidal particles.

(2) The possibility that such deformation may be produced by mechanical stress as arising from the possession of a certain amount of rigidity by such solutions.

(3) The analogy between the effects so produced and the double refraction due to a magnetic field.

Linnean Society, January 18.—Prof. W. A. Herdman, F.R.S., president, in the chair.—Coloured transparencies from flowers in natural colours: T. E. **Waltham.**—The life-history of *Margaritifera Panasesae*: A. W. **Allen.** The paper was interesting as the result of close observation in the field, though practically all had been observed by other observers in various parts of the world, and of various nationalities.—Some endophytic algæ: A. D. **Cotton.** The observations referred chiefly to *Endoderma viride*, Lagerh., which occurs abundantly in the tissues of *Nitophyllum Hilliae*, Grev., a deep-water alga, only obtainable by dredging. The author also gave the result of his study of *Streblonema intestinum*, Holmes and Batters, based upon Reinsch's preparations in the Kew herbarium.—The organ of Jacobson in Sphenodon: Dr. A. **Broom.**

February 1.—Prof. W. A. Herdman, F.R.S., president, in the chair.—The Percy Sladen Trust Expedition in H.M.S. *Sealark* to the Indian Ocean: J. Stanley **Gardiner.** Accounts of the work and results of the expedition were given by Mr. Gardiner in NATURE of April 13, August 10, October 5, November 9, December 21, 1905, and January 25 of the present year.

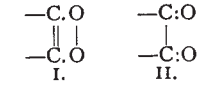
Anthropological Institute, January 23.—Prof. W. Gowland, president, in the chair.—Annual meeting.—Annual address: copper and its alloys in antiquity: **President.** Smelting had its origin in the camp fire, from which the first primitive furnace, a hole in the ground, used even now in parts of Japan, naturally evolved. The lumps of copper discovered in "founders' hoards" had clearly been smelted in this way. The hole was first filled with charcoal, over which was placed the ore, then another layer of charcoal, then more ore, and so on; the draught was obtained by the wind or by primitive bellows. The smelted copper was not run off, but, at the moment of solidification, was pulled out of the fire and broken into pieces on a large stone. This system is still practised in Korea, while the implements used by primitive man have their counterpart at the present day in the tools used by the native smelters in some parts of Africa. Turning to the question of bronze, Prof. Gowland stated that in his opinion this was made directly from a copper ore containing tin, long before the two metals were mixed. In Hungary a copper ore containing antimony takes the place of a copper-tin ore, and the implements found there frequently contain antimony in considerable amounts. He defined bronze as an alloy of copper and tin containing not less than 2 per cent. of tin; lead, arsenic, zinc, &c., being present in very small quantities. The president was of opinion that there was no evidence of a true Copper age in Europe, excluding only Cyprus, which was, of course, exceptional. Copper implements were only used by primitive man as adjuncts to stone implements, which were more efficient as weapons, and when found are only copies of stone implements, or when made in the Bronze age take the form of the implements of that period. In its simple form a copper celt could only be made in an open mould, and therefore only flat celts could be made of copper. The opinion often maintained, that the intention of the makers of bronze weapons was to make an implement in the proportion of 9 : 1, was shown by analysis to be incorrect, as also was the theory that the art of tempering bronze was lost, as it could now be hardened by hammering as well as, if not better than, it was done in the Bronze age. The lecturer also clearly proved that metallic tin was not necessary to the manufacture of bronze, and bronze celts made by him by melting metallic copper with tin ore, and from metal obtained by smelting a mixed ore of copper and tin in a primitive furnace in the metallurgical workshop of the Royal School of Mines, were exhibited. He also showed conclusively that the opinion held by many of the existence of a universal Copper age in Europe, intermediate between the Bronze and Stone periods of culture, was not warranted by the facts of the case.

Geological Society, January 24.—Dr. J. E. Marr, F.R.S., president, in the chair.—The igneous and associated sedimentary rocks of Llangynog (Caermarthenshire): T. C. **Cantrill** and H. H. **Thomas.** The sedimentary rocks associated with the igneous masses comprise Lower Old Red Sandstone, Didymograptus-bifidus beds, and Tetragraptus beds of the Ordovician. They occur in two anticlines, overfolded, and complicated by thrusts. The igneous rocks occur in three well defined areas, which belong to the same petrographical province. Both interbedded and intrusive rocks are represented; the latter include diabases and a large porphyry mass. The extrusive rocks occur in the following order:—(1) augite-andesites; (2) rhyolites; and (3) augite-andesites. The extrusive rocks are interbedded with fluxion-breccias and with tuffs; they are associated with the lower members of the Tetragraptus beds, and are consequently of Lower Arenig age; while the intrusive rocks have been injected into the extrusive rocks, and have also affected the Tetragraptus beds.—The Buttermere and Ennerdale granophyre: R. H. **Rastall.** From the facts put forward it is concluded that the intrusion is an example of an acid-magma, which has crystallised under the set of conditions that gives rise to a perfect development of granophyric structure. The masses appear to be of the "cedar-tree" laccolite type intrusive about the junction of the Skiddaw Slates and the Borrowdale rocks. Besides the normal acidic rock, there are some marginal patches of more basic character, showing obvious genetic relationship. These basic forerunners afford evidence of differentiation of the magma before intrusion—an example of Prof. Brögger's deep-magmatic differentiation. Considered as a whole, the character of the magma shows closer affinity to the tonalite group than to the true granites. The more basic types include dolerites, quartz-dolerites, and a rock type intermediate between quartz-dolerites and granophyres. There is also a development of peculiar rock types as the result of the re-mixing of previously differentiated partial magmas of an acid and a basic character respectively.

Challenger Society, January 31.—Dr. R. N. Wolfenden in the chair.—Four deep-water Caridæ from the west coast of Ireland: S. W. **Kemp.** *Acanthephyra purpurea*, a species showing so great variation that it is now possible to rank six other "species" as its synonyms; *A. debilis*, a very rare species with about 100 luminous organs; *Ægeon brendani*, and *Leontocaris lar*, spp. nn.—Report on the Chætognatha of the *Siboga* expedition in the Dutch East Indies: Dr. **Fowler.** Of sixteen species, only one appeared to be new. Among those taken only in deep

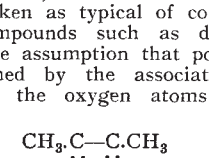
hauls were *Sagitta macrocephala* and *S. zetesios*, known only from deep water in the Atlantic, and *Krohnia hamata*. The species captured at the surface supported the alleged uniformity of the Indo-Pacific epiplankton. A systematic revision of all species hitherto described left twenty-four as valid. A revision of all captures of Chætognatha hitherto recorded appeared to show one (*hexaptera*) as cosmopolitan and pantothermal, others as eurythermal, and having a wide but not a universal range, others as confined to a limited area and stenothermal. As regards depth, four have been only recorded from the mesoplankton; two at the surface in polar waters seek the mesoplankton in warm seas; others are confined to the epiplankton. According to temperature, species appear to fall into five classes:—cold water species with a maximum of about 12° C., temperate species, warm water species with a minimum of about 16° C., species with a wide range of temperature, and a single pantothermal species. The writer also presented a note on Antarctic and sub-Antarctic Chætognatha taken on the *Discovery* and *Challenger* expeditions; these established *Krohnia hamata* as truly bipolar, from 81° 30′ N. to 77° 49′ S., and completed the cosmopolitan record of *hexaptera*; they also enabled the N. limit of *hamata* at the surface, and the S. limit of *serratodentata*, to be determined approximately.

Chemical Society, February 1.—Prof. R. Meldola, F.R.S., president, in the chair.—Hydroxylamine-$\alpha\beta$-disulphonates: T. **Haga.** These salts, obtained by hydrolysis of Fremy's *m*-sulphazilates, are decomposed by sodium amalgam, and are proved by the nature of this change to be hydroxylamine-$\alpha\beta$-disulphonates. This is believed to be the first indisputable case of the occurrence of fundamental structural isomerism among inorganic compounds.—Studies in the camphane series, part xxi., benzenediazo-ψ-semicarbazinocamphor and its derivatives: M. O. **Forster.** Compounds of this class have been obtained from diazotised aniline, *p*-toluidine, &c.; they are characterised by the readiness with which dilute alkalis resolve them into camphoryl-ψ-carbamide and the corresponding phenylazoimide.—The relations between absorption spectra and chemical constitution, part i., the chemical reactivity of the carbonyl group: A. W. **Stewart** and E. C. C. **Baly.** It is pointed out that in certain cases the phenomena of tautomerism furnish an explanation of the exceptional reactivity of the carbonyl group. From spectroscopic evidence it appears that in the α-diketones a vibration is going on, which, to a certain extent, resembles that which was found in the case of ethylacetoacetate and its derivatives. The nature of this vibration cannot be easily expressed in the ordinary structural formulæ without the possibility of misconception, but it may be indicated somewhat as follows:—The vibration is brought about by some change in the relations between the carbon and oxygen atoms, and in some respects resembles the transition from the ketonic to the enolic form and back again. Using this analogy, it may be postulated that the two extreme phases of the vibration can be represented by the formulæ



I. II.

It is proposed to call the general phenomenon "isorropesis," and to call "isorropic" those radicals the activity of which is thus produced.—The relation between absorption spectra and chemical constitution, part ii., the quinones and α-diketones: E. C. C. **Baly** and A. W. **Stewart.** In this paper it is shown that isorropesis in α-diketones results in the absorption of light in the visible blue region, so that the substances are intensely yellow. This is evidenced by camphorquinone and diacetyl. These observations strongly support Armstrong's theory that the colour of certain benzene derivatives is due to the quinonoid linking, for they show that the colour is caused, not directly by this linking, but by the isorropesis between the unsaturated atoms where this linking exists.—The relation between absorption spectra and chemical constitution, part iii., the nitranilines and the nitrophenols: E. C. C. **Baly,** W. H. **Edwards,** and A. W. **Stewart.** In this paper are described the absorption spectra of compounds having the quinonoid linking and containing a nitrogen atom in place of one or both of the quinone oxygen atoms. In the discussion, Prof. Armstrong said that Mr. Baly had put aside entirely the view which had long been held that ketonic interactions were conditioned by the combination of various substances with the carbonyl group, and had adopted an entirely *intra*-molecular view of change, whether chemical or physical. He still adhered to the opinion that three absorbing centres were required to produce visible colour, *i.e.* that iodoform, not methylene iodide, might be taken as typical of coloured substances. The colour of compounds such as diacetyl might be accounted for on the assumption that polymeric molecules were present, formed by the association, through the residual affinity of the oxygen atoms, of the ketonic groups, *e.g.*



This explanation might perhaps also apply to metanitrophenol and metanitraniline. He remarked subsequently that the blue colour of water might be accounted for from this point of view, but not by Mr. Baly's hypothesis.—The action of light on benzaldehydephenylhydrazone: F. D. **Chattaway.**—The union of chlorine and hydrogen: C. H. **Burgess** and D. L. **Chapman.**—Note on the molecular weight of epinephrine: G. **Barger** and A. J. **Ewins.**—The critical temperature and value of ML/Θ of some carbon compounds: J. C. **Brown.** The value of ML/Θ rises very slightly with the increase of CH_2 in the aliphatic alcohols, acids, and esters, but is very constant for the aromatic hydrocarbons.—Slow oxidations in the presence of moisture: N. **Smith.**—Fischer's salt and its decomposition by heat: P. C. **Rây.**—Action of quinones on *o*-diamines, *o*-nitroaniline, *m*-nitroaniline, and 2-nitro-*p*-toluidine. A preliminary note.—Some oxidation products of the hydroxybenzoic acids, ii.: A. G. **Perkin.** When gallic acid dissolved in 76 per cent. sulphuric acid is oxidised by means of potassium persulphate, a colouring matter very similar to ellagic acid is produced. This substance, to which the name flavellagic acid is assigned, is probably hexahydroxydiphenylmethylolid.—Contributions to the chemistry of oxygen compounds, part i., the compounds of tertiary phosphine oxides with acids and salts: R. H. **Pickard** and J. **Kenyon.**—The rapid electro-analysis of metals, preliminary note: H. J. S. **Sand.**

Mathematical Society, February 8.—Sir W. D. Niven, vice-president, in the chair.—The Eisenstein-Sylvester extension of Fermat's theorem: Dr. H. F. **Baker.** Sylvester gave in 1861 an expression for the residue, to modulus p, where p is an odd prime, of the integer $(\gamma^{p-1}-1)/p$. The result admits of simple proof and of extension to the case where the modulus is not prime, and the expression obtained for the residue is shown to be one of a definite number of possible representations.—A chapter of the present state in the historical development of the elliptic functions: Prof. H. **Hancock.** The paper deals chiefly with the contributions of Cayley and Eisenstein to that method of developing the theory of elliptic functions which is usually associated with the name of Weierstrass.—The reduction of the ternary quintic and septimic to their canonical forms: Prof. A. C. **Dixon** and Dr. T. **Stuart.** The method employed in the reduction is Sylvester's extended dialytic method of elimination.—The scattering of sound by spheroids and discs: J. W. **Nicholson.** The diffraction of plane sound waves by a very small spheroid has been discussed by Lord Rayleigh. The paper is occupied with the development of formulæ suitable for expressing the scattered waves in the case where the axis of the spheroid is parallel to the direction of the incident disturbance, and the dimensions of the spheroid are sufficiently small compared with the wave-length for an approximation proceeding by powers of the ratio of the equatorial radius to the wave-length to be valid.—A preliminary communication on partitions of numbers in space of two dimensions was made by Major P. A. **MacMahon.**

DUBLIN.

Royal Dublin Society, January 16.—Dr. W. E. Adeney in the chair.—Secondary radiation from compounds: Prof. J. A. **McClelland** and F. E. **Hackett.** The secondary radiation of β particles emitted by substances when they are acted upon by the β rays of radium has been previously measured by one of the authors for a large number of elementary substances. In the present paper a number of chemical compounds have been tested experimentally, and the secondary radiations from the compounds have also been calculated on the assumption that the secondary radiation is an additive atomic property. The close agreement between the calculated and the experimental value shows that the assumption is fully justified. This result is then used to determine the secondary radiation from a number of elements not available in sufficient quantity in the pure state to enable them to be studied directly. The relations previously established between the secondary radiation and the atomic weight are found to hold for all the additional elements thus investigated.—Electromagnetic mass: Prof. A. W. **Conway.** The electromagnetic inertia of an invariable system of electric charges is considered. A quadric is obtained such that if the force has the direction of the radius vector, the "mass" in that direction is as the inverse square of the length, and the direction of the acceleration is the perpendicular on the tangent plane. The mean mass of any such system is $4/3\,C^{-2}$, the work necessary to assemble it from a state of infinite diffusion.—Note on the sublimation of sulphur at ordinary temperatures: R. J. **Moss.** Twenty-five years ago some fragments of ordinary stick sulphur were enclosed in a glass tube, which was then exhausted by a Sprengel pump and sealed. After the lapse of twenty years indications of the formation of a crystalline sublimate became apparent; during the past five years the crystals have increased in number and in size to a marked extent; some of them are now 0·2 mm. in length, and the sublimate is deposited on one side of the tube throughout its whole length. The crystals are apparently rhombic, and are much more complex than those deposited from sulphur solutions.

EDINBURGH.

Royal Society, February 5.—Prof. Crum Brown, vice-president, in the chair.—The relation between normal "take-up" (or contraction) and degree of twist in twisted threads: T. **Oliver.** The paper was chiefly devoted to the properties of two-ply twisted yarns. The effect of twisting together two already twisted single threads was studied theoretically, and special attention was directed to the lengthening in the early stages of the second twisting due to the opening out of the single threads as the second twist was applied in the opposite direction to that of the first twists. Formulæ were deduced connecting the change of length with the amount of twist, and these were then compared with the results of experiment. The comparison was satisfactory, the discrepancies being such as might naturally be expected when due consideration was given to the necessarily imperfect nature of the assumptions on which the theoretical calculations were made. For example, the beginning of the contraction in the second twisting, when experimentally tested, occurred at a later stage than was indicated by the theoretical formula, a discrepancy which could be explained by the extremely probable supposition that the yarn had acquired a "set" in one direction during the first twisting.—Some experimental results in connection with the hydrodynamical theory of seiches: P. **White** and W. **Watson.** These experiments were undertaken at the suggestion of Prof. Chrystal, and the results obtained gave striking confirmation of several of his theoretical conclusions. The seiches were generated in a rectangular trough 5 feet long and 4·5 inches wide. Various bottom contours were obtained by means of blocks of wood cut to the desired form, such as parabola, concave or convex, semi-parabola, symmetrical rectilinear slope, and the quartic form which Prof. Chrystal had found to lead to a simple solution. The seiches were started by the to-and-fro motion of a strip of wire gauze placed at the position of a node of the required seiche, and kept in proper periodic motion by means of an attached heavy pendulum the length of which could be adjusted. By this method seiches of nodalites as high as the fourth, fifth, and even seventh, had in certain cases been obtained. The periods of these were easily determined, but the positions of the nodes and ventral segments could not be determined with the same accuracy. Within the errors of observation, the agreement with theory was generally very close. It was found that with the convex parabolic bottom the seiches were not so persistent as in the case of the concave bottom, but that the trinodal was more persistent than the uninodal. With the quartic contour of bottom the seiches were remarkably persistent up to that of the fourth nodality.

PARIS.

Academy of Sciences, February 5.—M. H. Poincaré in the chair.—On the existence of insoluble potassium compounds in the trunk and bark of the oak: M. **Berthelot.**—On the rotatory powers of hexahydrobenzylidene and œnanthylidenecamphors and their corresponding saturated derivatives, compared with the rotatory powers of benzylidene and benzylcamphors: A. **Haller** and F. **March.** These compounds were chosen for comparison since they contain the same number of carbon atoms, the substituting groups, benzylidene, hexahydrobenzylidene, and œnanthylidene, containing gradually increasing numbers of hydrogen atoms. Details are given of the methods of preparation of the various compounds, and of their physical properties. The conclusion is drawn that in benzylidenecamphor and its analogues, as in the benzylcamphors, it is the unsaturated character of the benzene ring which exerts its action on the elevation of the rotatory power of the asymmetric molecule to which it is attached.—Contribution to the chemical study of sea-water: Th. **Schlœsing.** A discussion of the results of chemical analyses of samples of sea-water taken at various points in the Mediterranean. The water of the Mediterranean differs from that of the Atlantic only by its degree of salinity, the mineral constituents of the two oceans being nearly identical.—Quasi-waves of shock, and the distribution of temperature in these quasi-waves: P. **Duhem.**—The provisional elements of the comet 1906*a*: E. **Maubant.** The calculations are based on observations made on January 29, 30, and 31.—Observations made on the sun at the Observatory of Lyons with the 16 cm. Brunner equatorial during the third quarter of 1905: J. **Guillaume.** The results of observations on forty-four days are summarised in three tables giving details of the spots, their distribution in latitude, and the distribution of the faculæ in latitude.—A problem in the calculus of variations: Erik **Holmgren.**—The general solution of the problem of equilibrium in the theory of elasticity, in the case where the displacements of the points of the surface are given: A. **Korn.**—Some results of the triangulation of the Pelvoux-Écrins massif: Paul **Helbronner.** The present paper deals with the rectification of the heights of some of the important peaks.—The condensation of the acetylenic nitriles with alcohols. A general method of synthesis of β-substituted β-oxyalkyl acrylic nitriles: Ch. **Moureu** and I. **Lazennec.** The nitrile $R—C\equiv C—CN$ is treated with alcoholic potash; the product is poured on to ice, extracted with ether, and submitted to distillation in a vacuum. The compound $R—C(OC_2H_5)=CH—CN$ is thus obtained. In the case of the aromatic compounds, this substance is easily hydrolysed by heating with dilute sulphuric acid, furnishing the ketone $R—CO—CH_2—CN$; with fatty compounds the hydrolysis is more difficult, and generally results in further changes.—Attempts at reduction in the diphenylamine series: H. **Duval.** A study of the effects of stannous chloride and zinc dust in alkaline solutions on azo-diaminodiphenylmethane.—Cyclohexylacetone: P. **Freundler.** The only method, out of several tried, which has given the desired ketone is the condensation of the iodide of hexahydro-benzyl-magnesium with acetaldehyde. The secondary alcohol thus obtained is oxidised to the ketone with chromic acid mixture. The yields are not good.—The absorption of alkaline carbonates by the mineral constituents of the soil: J. **Dumont.**—Observations on the preceding note: L. **Maquenne.**—The passage through the spinal ganglions of bundles arising from the motor roots and leading to the dorsal nerves in the Batrachians: P. **Wintrebert.**—The action of hordenine sulphate on soluble ferments and on micro-organisms: L. **Camus.** The sulphate of hordenine

retards the action of pepsin, trypsin, and rennet, but is without action on invertine, maltase, and lipasidin. It exerts an antiseptic action on bacilli.—The proportions of chloroform contained in arterial blood during anæsthesia and the effects produced: J. **Tissot.** There appears to be no direct proportion between the amounts of chloroform present in arterial blood and the anæsthetic effects produced.—Contribution to the study of the pathological anatomy of epithelial cancers of the prostate: MM. **Motz** and **Majewski.**—Trepanning and ventricular puncture in brain disease: O. **Laurent.**—The existence of limestone breccias in the mountains to the south-east of Mt. Blanc: M. **Kilian** and P. **Lory.**—Results of magnetic observations made at the Observatory of Athens during the years 1900–1903: D. **Eginitis.**—Note on an earthquake shock at Ebro: P. **Cirera.** The instruments at the Observatory of Ebro registered a shock between 3.47 p.m. and 6 p.m. on January 31. The magnetograph showed corresponding disturbances.

NEW SOUTH WALES.

Linnean Society, November 29, 1905.—Mr. T. Steel, president, in the chair.—Further notes on hybridisation in the genus Eucalyptus: J. H. **Maiden.** This paper briefly recapitulates recent work on the subject, directs attention to the fact that the credit of the discovery of natural hybridisation in this genus belongs to George Caley, whose observations were made in New South Wales before 1810, and indicates the guides which point to a natural hybrid.—Miscellaneous notes (chiefly taxonomic) on Eucalyptus, part ii.: J. H. **Maiden.** Reasons are given for the contention that the blue or flooded gum of coastal New South Wales (*E. saligna*, Sm.) cannot in reality be separated from the Bangalay (*E. botryoides*, Sm.), and the name var. *botryoides* is proposed for the latter.—On an undescribed species of Cryptocarya from eastern Australia: R. T. **Baker.**—Studies on Australian Mollusca, part ix.: C. **Hedley.** The marine molluscan fauna of New South Wales is enlarged by the addition of new species of Eulimella, Diala, Actæon, Mitromorpha, Rissoa, Bornia, and Cyamiomactra.—Descriptions of three new Australian species of the genus Austrogomphus (Neuroptera: Odonata): R. J. **Tillyard.**—(1) A pleomorphic slime-bacterium; (2) the probable identity of the opsonins with the normal agglutinins: R. Greig **Smith.**

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 15.

ROYAL SOCIETY, at 4.30.—The Influence of Increased Barometric Pressure on Man, No. 1: Dr. L. Hill, F.R.S., and M. Greenwood.—On the Existence of Cell-communications between Blastomeres: C. Shearer.—Innervation of Antagonistic Muscles. Ninth Note: Successive Spinal Induction: Prof. C. S. Sherrington, F.R.S.—The Chemical Constitution of Protoplasm as shown by the Rate of Tissue Disintegration: Dr. H. M. Vernon.—The Development of the Head-Muscles of the Common Fowl (*Gallus domesticus*), together with some Remarks on the Head-Muscles of Reptiles: Prof. F. H. Edgeworth.—Observations on the Labyrinth of Certain Animals: Dr. A. A. Gray.

CHEMICAL SOCIETY, at 8.30.—Cuprous Formate: A. Angel.—The Solubility of Triphenylmethane in Organic Liquids with which it forms Crystalline Compounds: H. Hartley and N. G. Thomas.—The Spontaneous Crystallisation of Supersaturated Solutions: H. Hartley.—The Preparation and Properties of some New Tropeines: H. A. D Jowett and A. C. O. Hann.—Studies in Asymmetric Synthesis, Part IV., The Application of Grignard's Reaction for Asymmetric Syntheses: A. McKenzie.

LINNEAN SOCIETY, at 8.—The Structure of *Isis hippuris*: J. J. Simpson.—Note on the Geographical Distribution of the Genus Shortia, Torr. and Gray: B. Daydon Jackson.—*Exhibition*: Developmental Changes in Zoogloea (with Lantern Slides): Dr. H. Charlton Bastian, F.R.S.

SOCIETY OF ARTS, at 4.30.—The Navigable Waterways of India: R. B. Buckley, C.S.I.

INSTITUTION OF MINING AND METALLURGY, at 8.—Pyritic Smelting: R. C. Alabaster and F. H. Wintle.—The Acme Combined Concentrating Table: L. H. L. Huddart.—Stadia in Careful Work: A. H. Webb.—The Detailed Mapping of Stoping Areas: H. R. Sleeman.—Sinking, Development and Underground Equipment of Deep Level Shafts on the Rand: A. E. Pettit.—The Hydraulic Filling of a Coal Seam at Lens, Pas de Calais, France: L. E. Hill and M. Butt.

FRIDAY, FEBRUARY 16.

ROYAL INSTITUTION, at 9.—The Passage of Electricity through Liquids: W. C. D. Whetham, F.R.S.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Large Locomotive Boilers: G. J. Churchward.

GEOLOGICAL SOCIETY, at 3.—Annual General Meeting.

SATURDAY, FEBRUARY 17.

ASSOCIATION OF TEACHERS IN TECHNICAL INSTITUTES (Regent Street Polytechnic), at 7.30.—The Teaching of Mathematics to Engineering Students: G. E. St. L. Carson.—The Teaching of Mathematics to Building Trade Students: H. Bustridge.

MONDAY, FEBRUARY 19.

SOCIETY OF ARTS, at 8.—Modern Warships: Sir William White, K.C.B., F.R.S.

VICTORIA INSTITUTE, at 4.30.—The Bible Pedigree of the Nations of the World: M. L. Rouse.

TUESDAY, FEBRUARY 20.

ROYAL INSTITUTION, at 5.—Food and Nutrition: Prof. W. Stirling.

INSTITUTION OF CIVIL ENGINEERS, at 8.—A Plea for Better Country Roads: G. R. Jebb.—Country Roads for Modern Traffic: J. E. Blackwall.

ROYAL STATISTICAL SOCIETY, at 5.—Wages in the Engineering and Shipbuilding Trades in the Nineteenth Century: A. L. Bowley and G. H. Wood.

ZOOLOGICAL SOCIETY, at 8.30.

WEDNESDAY, FEBRUARY 21.

SOCIETY OF ARTS, at 8.—Fisheries of the North Sea: Walter Garstang.

GEOLOGICAL SOCIETY, at 8.—The Constitution of the Interior of the Earth, as revealed by Earthquakes: R. D. Oldham.—The Tarannon Series of Tarannon: Miss Ethel M. R. Wood.

ROYAL MICROSCOPICAL SOCIETY, at 8.—On an Improved Method of taking Stereophotomicrographs and of Mounting the Prints: H. Taverner.—Exhibition of Slides of Oribatidæ, presented by N. D. F. Pearce.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Report on the Phenological Observations for 1905: E. Mawley.—Discussion of the General Features of the Pressure and Wind Conditions over the Trades-Monsoon Area: W. L. Dallas.—The Dispersal or Prevention of Fogs: Dr. W. B Newton.

SOCIOLOGICAL SOCIETY (School of Economics and Political Science, University of London, Clare Market, W.C.), at 8.—A Practicable Eugenic Suggestion: W. McDougall.

THURSDAY, FEBRUARY 22.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: On the Coefficient of Viscous Traction and its Relation to that of Viscosity: Prof. F. T. Trouton, F.R.S.—An Account of the Pendulum Observations made at Kew and Greenwich Observatories in 1903: Major G. P. Lenox-Conyngham.—And other Papers.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Crane Motors and Controllers: C. W. Hill.

FRIDAY, FEBRUARY 23.

ROYAL INSTITUTION, at 9.—The Internal Architecture of Metals: Prof. John O. Arnold.

PHYSICAL SOCIETY, at 5.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Graphical Determination of the Deflection of Beams: C. H. Sumner.

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